Evaluation of the European Synchrotron Radiation Facility (ESRF)

06-09 November 2017

Evaluation Panel Members (E-Panel):

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Dr. Sylvia Fanucchi, University of the Witwatersrand

1. Background and Terms of Reference for the Evaluation

1.1 Background (imported from Annexure 1: Terms of Reference for the Evaluation)

The Department of Science and Technology (DST) has adopted a Research, Development and Innovation Infrastructure Funding Framework that identifies five categories for infrastructure investment. These categories include: Scientific Equipment; Specialised Facilities; High-end Infrastructure; Cyber-infrastructure; and Access to Global Infrastructure (AGI).

AGI is recognised as an essential mechanism for South Africa to achieve international competitiveness in knowledge generation, innovation and human capital development. One of the global infrastructure facilities that forms a major part of the AGI strategy is that of the European Synchrotron Radiation Facility (ESRF) in France. The DST earmarked funds through a contractual agreement with the National Research Foundation (NRF) in support of the researchers and scientists to utilise the global infrastructure over a three-year period that commenced in 2011/12. Currently, South Africa has research cooperation agreements with: the Joint Institute of Nuclear Research (JINR) in Dubna, Russia; the European Organisation for Nuclear Research (CERN) in Geneva, Switzerland; and the ESRF in France.

The DST has identified the importance of the NRF to establish a contractual five-year Medium-Term Agreement with the ESRF for the use of the ESRF Facility as a research platform that will provide essential synchrotron infrastructural capacity for the generation of internationally competitive science and technology outputs. The DST, through the contractual agreement with the NRF, earmarked funds in support of this initiative over a five-year period that commenced in 2013/14. As an addendum to the DST-NRF AGI contract, the NRF signed an agreement with the ESRF in support of a scientific associateship membership over a five-year period.

In terms of the agreement, users of the ESRF from South Africa have the same right of access to scheduled beam time and support services at the ESRF and the same obligations as users from other contracting party countries in line with the ESRF review processes. The agreement allows South African researchers access to a maximum of 0.33% of beam time at the ESRF, which equates to approximately €331,702 per annum. South Africa's membership comprises 0.3% membership and 0.03% towards the upgrade and maintenance of the facility. Hence the membership fee is subjected to an annual increment of funds payable to the ESRF. As at 25th April 2017, R19,357 840.15 has been paid to the ESRF in membership fees for South African researchers to access the facility.
1.2 Strategic Objectives of the arrangement between the NRF and the ESRF are to:

- Provide the South African research community with access to world-class research infrastructure facilities;
- Develop the capacity in South Africa for the use of hard X-ray synchrotron light sources such as the ones presently available at the ESRF;
- Promote the enhancement of research programmes through the use of synchrotron as a premier research tool; and
- Create knowledge generation through the training of high calibre scientific and technical personnel in an environment which is supportive, enabling and internationally competitive.

1.3 The roles of the ESRF and the NRF are defined as follows:

- NRF
  - Pays membership fees to the ESRF on a quarterly basis, upon receipt of an invoice from the ESRF.
  - Receives annual statistics from ESRF on the usage of the ESRF beamline by South African researchers.
  - Verifies the users as indicated in the ESRF submitted statistics, with the respective South African researchers.
  - Reports to the DST on user statistics.

- ESRF
  - Opens independent calls for proposals.
  - Independently reviews research proposals for access to the facility.
  - Independently allocates beam time to researchers.
  - Independently manages the logistics for South African researchers to access the ESRF (travel, accommodation and subsistence).
  - Reports to the NRF annually on user statistics.

2. Purpose of the Evaluation

The purpose of the Evaluation was two-fold:

- To assess the overall performance of the NRF-ESRF Arrangement/Memorandum (of Understanding (MoU) (Annexure 2)) over the period from 01 April 2013 to 30 September 2017 in terms of its objectives and mandate clustered around the key performance areas that are defined in the evaluation dimensions described in Section 3 of the Terms of Reference (Annexure 1).
• To make recommendations to the NRF-DST on:
  o Overall perspective performance of the NRF-ESRF MoU;
  o Benefit to South Africa from the NRF-ESRF MoU;
  o NRF-DST:
    (i) continue with the NRF-ESRF MoU in its current form, at 0.33% beam time;
    (ii) discontinue the NRF-ESRF MoU; or
    (iii) revise the NRF-ESRF MoU.

3. Methodology

The Terms of Reference for the Evaluation, as mentioned earlier, are attached as Annexure 1.

In acquiring the necessary background information to the NRF-ESRF Arrangement the E-Panel had access to the following documents which are available from the Reviews and Evaluation Directorate of the NRF.

• The Project Funding Agreement Number 0237/2014 between the DST and the NRF signed on 13 October 2014 by the DST and on 23 October 2014 by the NRF.
• The Arrangement (Memorandum of Understanding) between the NRF and the ESRF signed on 21 May 2013.
• The ESRF Annual Reports for 2013/14; 2014/15; 2015/16; and 2016/17 from the Human and Infrastructure Capacity Development (HICD) Directorate of the NRF.

Note:
It must be noted the Evaluation Report from the ESRF in France was received from the ESRF Director General as part of the interview process that followed.

The E-Panel interviewed a range of stakeholders following a briefing by Dr Rocky Skeef, Executive Director: Reviews and Evaluations of the NRF, accompanied by his colleague Ms Joyce Olivier and Mr David Manamela. The schedule of interviews is presented in Annexure 3. Due to an unforeseen urgent commitment Dr Thomas Auf der Hyde, Chief Director: Research Development and Support of the DST was not able to attend the meeting with the Review Panel. The interview with Dr D Adams of the DST was held on Wednesday 08 November 2017.

In engaging with the different stakeholders the E-Panel focused on:

• The governance/management structure of the Arrangement between the NRF and the ESRF.
• The roles of, and the interactions between, the DST, NRF, ESRF and the Synchrotron Research Roadmap Implementation Committee (SRRIC).
• The success of applications by South African researchers for ESRF beam time and usage thereof.
• Outputs emanating from data accumulated through experiments run on the ESRF, including postgraduate students’ participation.

• Analysis of the internal (to the NRF) ESRF Annual Reports received from the NRF HICD Directorate and the Self-Evaluation Report from the NRF Sponsor Domain, as well as the external Evaluation Report from the ESRF.

4. Structure and Modus Operandi of the NRF-ESRF Arrangement

The Medium-Term Arrangement between the NRF and ESRF, as indicated in Section 1, was signed in May 2013 for the period 01 April 2013 to 31 December 2017, following earmarked funds provided by the DST to the NRF to utilise global research infrastructure. As a result an amount of R4 382 000 was reserved for ESRF membership, as was reflected in Table 1 of the 2013/2014 Annual Report of the NRF HICD Directorate. The funding was consolidated for another three years through a Project Funding Agreement (Number 0237/2014) signed between the DST and the NRF in October 2014, in which the DST committed to paying at total amount of R19 536 000 to the NRF of which R18 036 000 was to be used (R 6 012 000 annually) towards the Arrangement with the ESRF, and R 1 500 000 towards mobility and research capacity development at R500 000 per year. Of the annular amount of R6 012 000 towards the Arrangement with the ESRF, R 546 545 was to be a contribution towards the upgrading costs of the ESRF facility.

In terms of the NRF-ESRF Arrangement the ESRF makes quarterly calls for membership fee payment, which from an interview with the Manager: Finance and Administration of the NRF is paid following approved internal processes. With regard to allocation of synchrotron beam time, the ESRF makes an independent call to South African researchers twice a year in March and September. Following a strict peer-review process successful proposals are allocated beam time. It must be noted that this call is not made through the NRF nor is the HICD Directorate of the NRF informed of the call.

South African researchers who are allocated beam time on the synchrotron liaise directly with the ESRF in making their travel, accommodation and subsistence arrangements, which are paid by the ESRF against the membership fee paid by the NRF. It was noted that these researchers are contacted by the NRF to confirm their participation at the ESRF and thereafter to submit Completion Reports on an NRF-designed template.

In preparing its annual reports the HICD Directorate relies on data provided by the ESRF on South African researchers accessing the ESRF beam lines as well as beam time shifts delivered by South African researchers. The information is provided once a year and is brief. The timing of these annual reports from the ESRF do not necessarily coincide with an appropriate date for the NRF given that its required reporting on an annual basis covers the period 01 April of a particular year to 31 March of the following year, while ESRF follows the calendar year. Needless to say this negatively impacts on consistency in annual reporting.

The E-Panel was expecting to interview the ESRF Director General, Prof. F. Sette via a video conference. It was indeed a welcome surprise to interview him in person, accompanied by his colleague Dr. C. Mueller-Dieckmann of the Structural Biology Group at ESRF. Prof Sette informed the Panel they had arrived the day before the interview (on 05 November) and later that day met with the members of the Synchrotron Radiation Research Implementation Committee (SRRIC).
The Panel analysed the information provided by the ESRF on beam time allocation and usage, as well as the South African-linked research publications that were produced. With regard to the former it was found that there was at least a one year time lag between beam time allocation and the actual performance of the related experiment. As for the research publications the information on South African-linked publications had to be very carefully analysed. It was found, firstly, the list included publications that arose from beam time allocation to and usage by a South African researcher as the main member (principal investigator) that is paid for directly by the NRF through ESRF membership fee. The list also included publications in which South African researchers were part of a collaboration in which the principal investigator was from a country which is either a full member partner or a scientific associate of the ESRF (therefore not funded by the NRF-ESRF Arrangement). There is yet another caveat. It is a common practice for South African universities to appoint scholars employed at international universities and institutions who collaborate with their staff as honorary, extraordinary or adjunct professors. Such appointees use their home institutions as their official address and the South African institution is listed as a second affiliation on the publications. This alerted the Panel to a very productive researcher on the ESRF list of South African-linked publications whose home addresses is in a (northern) ESRF full member country, but he/she has a second affiliation with a South African university. Can this be classified as publications by a South African researcher? The E-Panel is of the view that only publications by fulltime employees of South African institutions or those who are employed at least on a 50% basis (as is the case for some SARChI Chairs) should be credited as South African outputs. In the case of active retired scholars, publications of those based for at least 50% of their time at a South African institution should qualify.

The E-Panel was further informed by the ESRF Director during the interview that Mr Tshepo Ntsoane of SRRIC was his official South African contact person. This was indeed a surprise to the Panel and immediately triggered questions on SRRIC: How was this entity established? Does it have an official or legal status? As a committee, what are its terms of reference and as such determined by whom? The Panel was informed that SRRIC is a user group community made up of synchrotron users within universities as well as industry-linked organisations such as NECSA and SASOL. Further probing of NRF and DST staff who were interviewed pointed to SRRIC being a self-initiated user group committee with no official status nor legal standing. However, the DST and the NRF have been engaging with the SRRIC and in 2011 supported a workshop held by SRRIC to brainstorm a possible strategic plan for synchrotron science in South Africa.

As mentioned earlier, the E-Panel was informed that comprehensive annual reports from ESRF are not received by the HICD Directorate of the NRF. Only limited information on beam time allocation and usage is provided. The Panel did not have access at the start of the Evaluation process to the list of research publications by South African researchers emanating from ESRF. A total of 60 publications over the reporting period was mentioned by the ESRF Director in his report and repeated later by Mr Tshepo Ntsoane of SRRIC whose presentation had much of the data presented by Professor Sette, Director General of ESRF. It was therefore puzzling that while South African related ESRF data and information is readily accessible to SRRIC, this is not so in the case of the NRF, the agency that funds the Arrangement with the ESRF, especially since the list of South African linked ESRF research publications, which was requested by the E-Panel during the interview with the ESRF Director General, was emailed to the Panel the very next day. The E-Panel’s analysis of the publication list is provided in Annexure 4.
On probing further and drawing comparison with the other two AGI partnerships with CERN and JINR, the Panel found that the NRF-ESRF Arrangement has neither a governance nor a management structure.

In the interviews with stakeholders the Panel explored the benefits to South Africa arising from the NRF-ESRF Arrangement. Information provided by the ESRF Director General indicated that ESRF is an international synchrotron facility with full member partners made up of 7 European countries, Russia, a consortium of 4 Nordic countries and the United Kingdom. South Africa is one of 9 Scientific Associates. ESRF is located in Grenoble within a vibrant European photon and neutron campus which provides opportunities for further collaboration. The ESRF is at this point in time probably the most advanced synchrotron facility in the world with 44 beam lines, available to a wide range of disciplines from structural biology, palaeontology to the hard sciences. The ESRF allows for ground breaking research, resulting in the award of 4 Noble Prizes thus far from work done at the facility.

5. Findings

5.1 The NRF-ESRF Arrangement was signed in 2013, NRF pays an annual membership fee, on the average just over R5 million per year.

5.2 The NRF-ESRF collaboration has neither a governance nor a management structure as is in place for other Access to Global Infrastructure agreements.

5.3 The ESRF calls for proposals, conducts reviews and allocates beam time totally independent of the NRF.

5.4 The only form of communication between the ESRF and the NRF, apart from request by ESRF for membership fee payment, is in the form of annual SA-users statistics from the ESRF to the NRF.

5.5 The information provided by the ESRF to the NRF is produced in a very limited format which does not allow an accurate measurement of success in the form of research publications, capacity development in the form of enrolment and graduation of postgraduate students, emerging scholars, gender and race transformation.

5.6 The ESRF engages directly with the Synchrotron Radiation Research Implementation Committee (SRRIC), a self-established South African user group committee which, according to records, has no official or legal standing.

5.7 South African researchers who are allocated beam time at the ESRF have their travel, accommodation and subsistence paid for by the ESRF by virtue of the membership fee paid by the NRF.

At present, the researchers are required by the NRF to confirm their participation at the ESRF. In addition, they are required to submit a Completion Report online. A perusal of one such completed 2016 report made available to the E-Panel revealed that section 5 on research outputs and section 6 on human capacity development (HCD), which is measured by graduating students and participation of postdoctoral research fellows, were left blank. This may be understandable if the report was submitted soon after the experiment was conducted at the ESRF. This then raises the question if in such a case follow up reports are necessary to assess research outputs and HCD.
5.8 Because there is a minimum of at least a year-long lag time at the ESRF between beam time allocation and actual performance of experiments for data collection, followed by data analysis and manuscript preparation, the period from allocation of beam time to eventual related publications can exceed 2 years.

5.9 South Africa's global presence has been strengthened through the ESRF Arrangement:

5.9.1 Offers cutting edge facility to diverse disciplines—e.g. material science, palaeontology, physical sciences and structural biology—outputs can enhance global impact of South African research.

5.9.2 Enhances the skills set of South African researchers.

5.9.3 As a leading international synchrotron facility, the ESRF creates opportunities for interactions and potential collaboration with a broad range of scholars from across the world.

5.9.4 The Grenoble location allows access to neighbouring neutron and photon facilities in addition to the additional facilities located at the ESRF.

5.9.5 Offers an opportunity to develop researchers from historically disadvantaged communities into high-level international scholars, provided a well-structured development plan is in place.

5.9.6 South African researchers have had on average a 51% success rate in the acceptance of their proposals for beam time and this is in line with the global success rate.

5.9.7 South Africans have reached the target of 0.33% beamline access over the reporting period with the major contributing disciplines being earth sciences, applied materials science, structural biology and chemistry.

From information provided by the ESRF Director at the request of the E-Panel:

5.10 Despite reaching the target beam time usage, approximately 50% of research groups that have been awarded beam time have published their research within the reporting period.

5.11 The total number of South African publications produced within the reporting period is 46, many of which include South African researchers who were part of international collaborations and did not benefit directly from the NRF-ESRF Arrangement. Of the total, 16 publications come from South African researchers who benefited from the NRF-ESRF Arrangement.

5.12 The publication rate emanating from the NRF-ESRF Arrangement is on average 3.2 papers per year over 5 years but encouragingly the average number of papers per year increases 4-fold in the last two years of the reporting period.

5.13 Palaeontology currently significantly supersedes the other disciplines in terms of both beam time usage and numbers of publications.

5.14 The average impact factor of the 16 publications is 3.6 with two of the publications being published in journals with an impact factor greater than 7.
5.15 The information regarding students benefitting from the Arrangement is not available from the ESRF and NRF reports as no formal reporting structure currently exists in this regard.

6. Recommendations

6.1 It is recommended that the NRF-ESRF Arrangement be extended to a second term with membership remaining at the current maximum of 0.33% beam time, subject to:

The NRF-ESRF Arrangement be renegotiated to accommodate the following:

6.1.1 The establishment of NRF-ESRF joint governance/management structures.

6.1.2 The NRF as the South African funding agency must serve as the official South African contact point and the official channel of communication.

6.1.3 The NRF must be copied into the ESRF Calls for proposals and kept fully abreast of applications received from South Africa, the proposal review process and the beam allocation decisions.

6.1.4 All ESRF reports are to be submitted to the NRF for study, analysis and dissemination. In this regard agreement must be reached between the NRF and ESRF on nature of reports and receipt dates.

6.1.5 There has to be regular engagements between the NRF and the ESRF, including face-to-face interactions, eg. via Skype or Video Conference, in ensuring the Arrangement is directed towards the strategic objectives.

6.1.6 The NRF needs to engage with the ESRF, if necessary with its Council, on how the NRF can be involved in ensuring that beam time allocation to South African researchers addresses the South African research priorities, including transformation.

6.1.7 The NRF should request detailed feedback on peer review reports of proposals submitted by South African researchers, especially the unsuccessful submissions so as to revise appropriately before resubmission.

6.2 The DST/NRF need to clearly outline their relationship with SRRIC and unambiguously clarify to the ESRF what SRRIC’s role is in the NRF-ESRF Arrangement.

6.3 The NRF needs to be much firmer in holding South African researchers allocated beam time on ESRF accountable so that the NRF’s investment in the Arrangement with the ESRF does address the national imperatives of excellence, capacity development, transformation and redress. This calls for regular reporting on research outputs, participation of emerging scholars, postgraduate students, expansion of research programme, etc. This would also align to the NRF’s Annual Performance Plan reporting requirements.

6.4 With regard to financial component of the NRF reports, the E-Panel recommends that instead of creating independent tables which can lead to errors and inconsistencies, the NRF reports should refer to financial reports which are signed off by the relevant expert in the Finance Directorate of the NRF and are attached to the NRF reports.
6.5 The challenges related to the implementation of the NRF-ESRF Arrangement are being reflected upon in this Review and Evaluation at the end of the 4-year contractual agreement.

It is therefore recommended that for such contractual agreements the DST/NRF be proactive going forward. For example, by undertaking an interim monitoring exercise to assess what is working and what is not. Thereafter, it will be advisable to immediately alert the contracting party of the concerns and the need to renegotiate, if necessary, the structure and the terms of the agreement prior to renewal.

Important Note:

The E-Panel was informed by the ESRF Director General that the ESRF will SHUTDOWN for 20 months from December 2018 to September 2020 for upgrade. However, the other facilities, e.g. the Cryo-Electron-Microscope facility, will remain operational.

7. Conclusion

The E-Panel noted that the ESRF Shutdown will affect researchers from all member partner countries and the scientific associate countries. Therefore, in order not to adversely affect South Africa’s global standing, the Panel recommends a renewal of the NRF-ESRF Arrangement (subject to negotiations as recommended above) despite the fact that no research will be undertaken on the synchrotron during the period December 2018 to September 2020. The Panel is of the view the longer-term benefits from an upgraded ESRF will exceed the negative effect on outputs arising from the temporary shutdown.

Prof Ramesh Bharuthram

Convenor

07 December 2017
Terms of Reference

For the

Evaluation of the

European Synchrotron Radiation Facility (ESRF)

September 2017
# Abbreviations and Acronyms

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AGI</td>
<td>Access to Global Infrastructure</td>
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<td>AP</td>
<td>Assignment Principal</td>
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<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
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<td>CERN</td>
<td>Russia and the European Organisation for Nuclear Research</td>
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<td>DST</td>
<td>Department of Science and Technology</td>
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<td>ESRF</td>
<td>European Synchrotron Radiation Facility</td>
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<td>HICD</td>
<td>Human and Infrastructure Capacity Development</td>
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<td>JINR</td>
<td>Joint Institute of Nuclear Research</td>
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<td>MoU</td>
<td>Memorandum of Understanding</td>
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<td>NRF</td>
<td>National Research Foundation</td>
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<td>RE</td>
<td>Reviews and Evaluations</td>
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<td>RISA</td>
<td>Research and Innovation Support and Advancement</td>
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<td>ToR</td>
<td>Terms of Reference</td>
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1. Background

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  - Pays membership fees to the ESRF on a quarterly basis, upon receipt of an invoice from the ESRF.
  - Receives annual statistics from ESRF on the usage of the ESRF beamline by South African researchers.
  - Verifies the users as indicated in the ESRF submitted statistics, with the respective South African researchers.
  - Reports to the DST on user statistics.

- **ESRF**
  - Opens independent calls for proposals.
  - Independently reviews research proposals for access to the facility.
  - Independently allocates beam time to researchers.
  - Independently manages the logistics for South African researchers to access the ESRF (flight, accommodation and Subsistence & Travel).
  - Reports to the NRF annually on user statistics.

2. **Purpose**

The purpose of the evaluation will be twofold:

- To assess the overall performance of the NRF-ESRF agreement/Memorandum of Understanding (MoU) (See annexure 1) over the period 1 April 2013 to 30 September
2017 in terms of its objectives and mandate clustered around the key performance areas that are defined in the evaluation dimensions described in Section 3 of this document.

- To make recommendations to the NRF-DST on:
  - Overall prospective performance of the NRF-ESRF MoU;
  - Benefit to South Africa;
  - NRF-DST (i) continue with the NRF-ESRF MoU in its current form, at 0.33%; (ii) discontinue; or (iii) be revised.

3. Evaluation Dimensions

The evaluation panel is requested to conduct the evaluation in terms of the dimensions as captured below and these are linked to the contract between the NRF and the ESRF. The panel is referred to the contract document for more detail on these dimensions (see essential reading annexure 1):

- **Research**
  - Publications and other research outputs from use of the equipment; and
  - The disciplines supported by researchers accessing the ESRF beamlines.

- **Access and usage**
  - Accessibility of equipment for South African researchers (% beam time used);
  - Success rate of South African research proposals to use the equipment (successful proposals vs submitted proposals); and
  - South African researchers and students accessing the facility.

4. Scope

The focus of the evaluation will be to provide a summative review covering the period 01 April 2013 to 30 September 2017.

5. Methodology

The following approach will be used to evaluate the performance of the NRF-ESRF MoU comprising the following:

- Self-evaluation reports which should include:
  - Cover page;
o Information on authors and contact;
o Executive summary;
o Table of contents;
o Meeting of the objectives, activities that constitute the evaluation dimensions in section 3; and
o Quantitative data

- Semi-structured interviews with relevant national and international stakeholders in which the reviewers will pursue their own line of questioning during interviews.

6. Key Role-Players

The role-players are presented in the illustration below, followed by the narrative which elaborates on their roles.

6.1 Assignment Principal
The Assignment Principal (AP) is the NRF represented by the Deputy CEO: Research and Innovation Support and Advancement (RISA). The role of the AP will be to:

- Approve the proposal;
- Approve the budget;
- Approve the members of the review panel;
- Consider and suggest suitable interviewees for the review panel;
- Approve the review programme and time frame for the review process;
- Ensure that the review report addresses the ToR;
• Accept the report submitted by the review panel; and
• Accept the response of the Sponsor Domain to the report;

6.2 Service Provider
The RE Domain will provide the management and secretariat for the review process. Its responsibilities will be to:
• Conceptualise the proposal for the review based on the background provided by Sponsor Domain;
• Develop the ToR based on the approved proposal;
• Facilitate the identification and selection of potential evaluators;
• Prepare letters of invitation for the approved members of the review panel for the AP’s signature and distribute these;
• Develop a programme and budget;
• Coordinate and manage the entire process, including logistics;
• Provide support to the panel;
• Source the necessary documents stipulated in the ToR with the assistance of the Sponsor Domain and make these available to the panel timeously prior to the commencement of the programme;
• Receive the report by the panel and submit it to the Sponsor Domain for:
  o The identification of factual inaccuracies where after the Service Provider will forward these to the panel for consideration and possible amendment of the report; and
  o A strategic management response.
• Submit the final report and management response to the report to the AP for NRF acceptance and possible further action; and
• Place the final report and response on the NRF website within one month of acceptance of these documents by NRF management and after confirmation with the AP.

6.3 Sponsor Domain
In this case the Sponsor Domain is HICD. Its role will be to provide, amongst others:
• A self-evaluation report for the period under evaluation prior to the commencement of the onsite programme.
• A self-evaluation report which should address the ToR and should cover the period from 1 April 2013 to 30 September 2017. The report should not exceed 40 pages with annexures.
• Concise information on the funds received per year.
• Provide RE with the names and contact details of potential reviewers and advance reasons for the suggestions on the template provided (see annexure 2);
• Supply names and contact details of stakeholders that should be interviewed by the panel and rank them in order of priority on the template provided (see annexure 3);
• Provide a list of the most important documents that are considered to be essential reading and additional reading for the reviewers (see annexure 1);
• Supply electronic versions of the documents that are not in the public domain;
• Check the report for factual inaccuracies by the deadline per the project schedule; and
• Compile a strategic management response to the report within two weeks of receipt of the report.

6.4 ESRF
The ESRF Director General, Dr Francesca Settee, will prepare a self-evaluation report for the evaluation. The report should address the ToR and the scope of the review. The report must be received by the RE prior to the commencement of the onsite programme.

6.5 Evaluation Panel
A panel of two members with appropriate experience (Physics and Molecular Biologist) and skills from South Africa will be appointed. The sourcing of suitable reviewers will be of critical importance taking into account areas of race, gender and institutional affiliation. RE will rely on the cooperation of the AP and Sponsor domain in this regard. One of the panel members will be appointed as Convener and will be responsible for ensuring the delivery of the report.

The responsibilities of the panel will be to:
• Familiarise themselves with the ToR and revise the programme where may be necessary, to advance the achievement of the objective of the evaluation;
• Conduct the evaluation which includes:
  o Reading and interpreting the documents listed as “Essential reading” in the ToR;
  o Interviewing the stakeholders to source information that may assist them in their task of addressing the ToR;
Giving a verbal feedback of their findings and recommendations to interested parties at the conclusion of the actual evaluation;

- Draft and finalise the Evaluation Report within a pre-determined time frame which should include:
  - An executive summary;
  - Table of contents;
  - Background to the evaluation;
  - Evaluation questions that were addressed;
  - Key findings;
  - Recommendations;
  - Conclusions; and
  - Annexures (e.g. ToR, persons interviewed).

It will be the responsibility of the Convener of the evaluation panel to:

- Facilitate the interview sessions in a manner that enables participation by all;
- Manage the activities of the evaluation panel such that they align to the ToR and Programme for the Evaluation;
- Drive the consolidation and production of the evaluation report;
- Deliver the report by the agreed date; and
- Consider any factual inaccuracies in the report pointed out by RE on behalf of the Sponsor Domain, and possibly amend report.

6.6 Stakeholders

The stakeholders to be interviewed by the panel will be selected from the suggestions by the Sponsor Domain, the AP and RE.

The interviewees will be expected to:

- Attend the interviews in person, if at all possible, otherwise by video or telephone conference;
- Share their knowledge with the reviewers on the subject/s under review;
- Be frank, honest and objective in their interaction with the reviewers.
7. Summary of Deliverables

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Lead responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background material/information to facilitate compilation of proposal by RE</td>
<td>HICD</td>
</tr>
<tr>
<td>Proposal</td>
<td>RE</td>
</tr>
<tr>
<td>Terms of reference</td>
<td>RE</td>
</tr>
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<td>Budget compilation</td>
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<td>Evaluation programme</td>
<td>RE</td>
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<td>Self-evaluation Report</td>
<td>RE</td>
</tr>
<tr>
<td>Completed RE template with contact details of suggested reviewers</td>
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</tr>
<tr>
<td>Completed RE template with contact details of suggested stakeholders ranked in order of importance</td>
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<tr>
<td>List of essential and additional reading material for insertion into Annexure of ToR</td>
<td>HICD</td>
</tr>
<tr>
<td>Electronic versions of documents not available in public domain</td>
<td>HICD</td>
</tr>
<tr>
<td>Evaluation report</td>
<td>Evaluation panel</td>
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<td>RE</td>
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<tr>
<td>Factual inaccuracies in evaluation report</td>
<td>HICD</td>
</tr>
<tr>
<td>Management response to evaluation report</td>
<td>HICD</td>
</tr>
<tr>
<td>Placement of evaluation report and management response on NRF website</td>
<td>RE</td>
</tr>
</tbody>
</table>

8. Reading Material

**Essential reading**

- Arrangement between NRF and ESRF dated 21 May 2013
- Project funding agreement No:0237/2014 DST and NRF signed 13 October 2014
- ESRF Evaluation Terms of Reference
- ESRF Self-Evaluation report
- Sponsor Domain Self-Evaluation report
- Annual performance reports from HICD from 2013/14 to 2017

**Optional Reading**

- NRF-ESRF financial reconciliation
- National Research and Development Strategy
- DST Ten Year Innovation Plan
ARRANGEMENT

between

the National Research Foundation of the Republic of South Africa

and

the European Synchrotron Radiation Facility

concerning the medium-term scientific use of synchrotron radiation for non-proprietary research

The National Research Foundation of the Republic of South Africa, hereinafter referred to as “the NRF”, represented by Dr Albertus Stefanus van Jaarsveld, Chief Executive Officer, located at NRF Building, CSIR South Gate, Meiring Naude Road, Brummeria, Pretoria 0184, Republic of South Africa

on the one hand,

and

the European Synchrotron Radiation Facility, hereinafter referred to as “the ESRF”, Societe Civile subject to French law, represented by Dr Francesco SETTE, Director General, and Mr Luis Sánchez Ortiz, Director of Administration, located at 6 rue Jules Horowitz, BP 220, F-38043 Grenoble Cedex 9, France,

on the other hand,

hereinafter together referred to as “the Parties”.

have agreed upon the following provisions:
PREAMBLE

The multi-governmental Convention concerning the construction and operation of the ESRF signed by the representatives of the Contracting Parties on 16 December 1988 in Paris, and the Statutes of the ESRF, signed on the same date by representatives of the Members of the Société Civile ESRF, specify that the Facility is dedicated to the use by the scientific communities of the Contracting Parties.

Nevertheless, the Convention provides for the option of making arrangements for the long-term use of synchrotron radiation by Governments or groups of Governments not acceding to the Convention, or by establishments or organisations thereof, subject to the unanimous agreement of the ESRF Council (Article 8 of the ESRF Convention). Furthermore the ESRF Statutes (Article 8.3[i]) mention the option of short and medium term arrangements for use of the ESRF by national or international organisations.

Strong scientific collaborations between scientists of South African research organisations and the ESRF have existed for several years. Through these collaborations, some highly important breakthrough results have been obtained in many fields, notably in the domains of palaeontology, materials science and macromolecular crystallography, as well as in industrial projects. The number of such collaborations has been steadily increasing over time and, during the period 2007-2012, approximately 1% of the proposals received for the use of ESRF beamlines and experimental facilities originated from scientific collaborations which included South African research institutes. Out of these proposals, South African research institutes were allocated about 0.25% of the total beam time. Taking the above into consideration, it is now the wish of the NRF to formally participate in the ESRF, on behalf of the South African scientific community, at a level consistent with the size and interests of this community.

The ESRF Council agreed at its 58th meeting, held on 26-27 November 2012, that an Arrangement be concluded with the National Research Foundation of the Republic of South Africa concerning the medium-term use of synchrotron radiation for non-proprietary research.

Article 1 - Purpose of the Arrangement

1.1 The present Arrangement sets out the conditions under which Users (cf. § 2.3 below) from the Republic of South Africa may use the synchrotron radiation and the experimental facilities of the ESRF.

1.2 The documents that govern this Arrangement are:
   I. The present Arrangement
   II. Its annexes:
      Annex 1 - "Procedures for the allocation of beam time on ESRF beamlines for non-proprietary research"
      Annex 2 - The ESRF Convention and its annexes.
Article 2 - Definitions

2.1 In the framework of this Arrangement, the notion of a “Contracting Party” is the one used in the “Convention concerning the construction and operation of a European Synchrotron Radiation Facility”, i.e. a Government or a group of Governments that has initially signed the ESRF Convention and its annexes or acceded thereto later on.

2.2 A “Scientific Associate” is a Government or a group of Governments not acceding to the ESRF Convention, or establishments or organisations thereof, with whom the ESRF has made an Arrangement in accordance with Article 8 of the ESRF Convention.

2.3 For the purpose of this Arrangement, a “User” is a scientist or a member of a team carrying out a peer reviewed experiment to which beam time has been allocated in accordance with the ESRF’s “Procedures for the allocation of beam time on ESRF beamlines for non-proprietary research” (Annex 1).

Article 3 - Use of the ESRF

3.1 Users from the Republic of South Africa have the same right of access to scheduled beam time and support services at the ESRF and the same obligations as Users from Contracting Party countries, as set out in the “Procedures for the allocation of beam time on ESRF beamlines for non-proprietary research” in their current form (Annex 1) or as from time to time might be amended by the Council of the ESRF. In particular:

- Scientists from the Republic of South Africa may submit proposals for experiments either in their own right or in collaboration with scientists from other countries.
- Beam time will be allocated by the Director General of the ESRF based on the scientific merit of the proposals judged through peer review. Proposals will be assessed by Review Committees made up of qualified scientists, reporting to the ESRF Management.
- Successful proposals from the Republic of South Africa will receive technical and other support similar to that given to proposals from the Contracting Party countries of the ESRF.
- Users from the Republic of South Africa will be reimbursed the travel and subsistence expenses required to carry out their experiments in Grenoble, according to the rules in force at the ESRF.

3.2 Any beam time allocated to Users from institutes based in other non-Contracting Party countries but collaborating with Users from the Republic of South Africa, will be accounted for in the same way as for Users from Contracting Party countries in the same situation.

3.3 The NRF may not cede all or part of its rights in the present Arrangement to a third party.
3.4 The present Arrangement does not grant to the NRF the right to establish a Collaborating Research Group beamline at the ESRF.

Article 4 - Financial participation

4.1 For its use of synchrotron radiation at the ESRF as determined under the terms of Articles 3 and 4, the NRF will pay as contributions towards:

(a) the annual operating costs of the facility:
   0.3% of the contributions of the Members to the annual budget of the ESRF, exclusive of value added tax;
(b) the initial construction costs of the facility:
   a fee of 0.03% of 228 673 000 €, i.e. 68 602 €, per year.

4.2 Contributions will normally be called for in four equal instalments per year, which shall be paid in Euros within 45 days of the call. Other payment arrangements may be agreed between the Parties. In particular, for periods of less than one year, the contributions will be adapted on a pro rata basis.

4.3 The contribution from the NRF will be included in the ESRF budget and is subject to the general rules for that budget. No specific or separate budgetary account will be set up for the implementation of this amount.

4.4 The present Arrangement is based on
   • the availability of a specific number of ESRF beamlines, and
   • a normal operating schedule providing for a specific number of hours per annum for beamline use,
   each of which will be determined from time to time by the ESRF Council.

Article 5 - Personnel from the Republic of South Africa

5.1 The NRF may second staff to the ESRF or propose guest research workers in accordance with §§ 12.4 and 12.5 of the ESRF Statutes (cf. Annex 2 to this Arrangement).

5.2 The provisions on intellectual property as laid down in §§ 14.5 and 14.6 of the ESRF Statutes apply analogously.

Article 6 - Duration and Renewal

6.1 This Arrangement will enter into force on 1 April 2013 and will be valid until 31 December 2017, or until an Arrangement on the long-term use of synchrotron radiation between the ESRF and the NRF comes into effect, whichever is the sooner.
6.2 The Arrangement can be extended only if the Parties agree in writing.

Article 7 - Disputes

7.1 The present Arrangement is subject to French law.

7.2 In the event of a disagreement related to the interpretation or application of this Arrangement the Parties shall make every effort to reach an amicable settlement. If they are unable to do so the provisions of the present Arrangement, with the exception of § 7.3, shall be suspended sine die.

7.3 Any claim by one party against the other which cannot be settled by the parties out of court may be brought before the competent Court in Grenoble, which for the purposes of this Arrangement is the Tribunal de Grande Instance in Grenoble.

Article 8 - Final provisions

8.1 Each Party has the right to terminate the Arrangement by registered letter giving six months notice, but it may only be terminated at an annual anniversary.

8.2 Any amendment to this Arrangement or its annexes shall be the subject of a supplementary written agreement. All legal documents relating to this Arrangement shall be in English.

Signed in Grenoble on 21 May 2013, in duplicate.

For the NRF

p.p. Nithaya Chetty
NRF Group Executive for Astronomy

Albertus Stefanus van Jaarsveld
Chief Executive Officer

For the ESRF

Francesco Sette
Director General

Luis Sanchez Ortiz
Director of Administration
**Annexure 3**

**NATIONAL RESEARCH FOUNDATION (NRF) REVIEW OF THE EUROPEAN SYNCHROTRON RADIATION FACILITY (ESRF)**

Review panel members:

- Prof Ramesh Bharuthram, University of the Western Cape (Convener)
- Dr Sylvia Fanucchi, University of the Witwatersrand

**6 November 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:30</td>
<td>Reviewers to proceed to NRF</td>
</tr>
<tr>
<td></td>
<td><strong>Venue:</strong> Phillip Tobias</td>
</tr>
<tr>
<td>09:00</td>
<td><strong>Briefing of reviewers</strong></td>
</tr>
<tr>
<td></td>
<td>- Dr Rocky Skeef, Executive Director: Reviews and Evaluation (RE)</td>
</tr>
<tr>
<td></td>
<td><strong>Also present:</strong></td>
</tr>
<tr>
<td></td>
<td>- Mr David Manamela, Professional Officer: RE</td>
</tr>
<tr>
<td></td>
<td>- Ms Joyce Olivier, Director: RE</td>
</tr>
<tr>
<td>10:00</td>
<td><strong>Discussion of review programme logistics with staff on NRF’s RE unit</strong></td>
</tr>
<tr>
<td></td>
<td>- Mr David Manamela, Professional Officer: RE</td>
</tr>
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<td></td>
<td>- Ms Joyce Olivier, Director: RE</td>
</tr>
<tr>
<td>10:30</td>
<td>Tea/coffee</td>
</tr>
<tr>
<td>11:00</td>
<td>Panel members to prepare their strategy and allocation of tasks among themselves</td>
</tr>
<tr>
<td>12:00</td>
<td><strong>Interview with ESRF Director General</strong></td>
</tr>
<tr>
<td></td>
<td>- Professor Fransesco Sette</td>
</tr>
<tr>
<td></td>
<td>- Dr Christoph Nueller-Diecunnann</td>
</tr>
<tr>
<td>13:00</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:00</td>
<td><strong>Interview with ESRF users</strong></td>
</tr>
<tr>
<td></td>
<td>- Prof Giovanni Hearne, University of Johannesburg</td>
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<tr>
<td></td>
<td>- Prof Bruce Rubidge, University of Witwatersrand</td>
</tr>
<tr>
<td></td>
<td>- Prof David Billing, University of Witwatersrand</td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
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<td>-------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>15:00</td>
<td>Interview with Synchrotron Road Map Committee (SRRIC)</td>
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<tr>
<td>16:00</td>
<td>Interview with member of SRRIC via Video conference</td>
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<td>16:30</td>
<td>Reviewers to return to accommodation [Shuttle service/ rental car]</td>
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### 7 November 2017

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<td></td>
<td><strong>Venue:</strong> Phillip Tobias</td>
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<tr>
<td>09:00</td>
<td><strong>Interview with RISA: Finance</strong></td>
</tr>
<tr>
<td></td>
<td>• Mrs Rentia Hamilton: Manager, Finance and Administration</td>
</tr>
<tr>
<td>09:30</td>
<td><strong>Interview with ESRF, Human and Capacity Infrastructure Development</strong></td>
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<td>(HICD): NRF</td>
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<tr>
<td></td>
<td>• Dr Rakeshnie Ramoutar-Prieschl, Director</td>
</tr>
<tr>
<td></td>
<td>• Dr Romilla Maharaj, Executive Director</td>
</tr>
<tr>
<td>10:30</td>
<td><strong>Tea/coffee</strong></td>
</tr>
<tr>
<td>11:00</td>
<td><strong>Interview with the Department of Science and Technology</strong></td>
</tr>
<tr>
<td></td>
<td>• Dr Dipuo Kgotleng, Deputy Director: Science Platforms</td>
</tr>
<tr>
<td>12:00</td>
<td><strong>Lunch</strong></td>
</tr>
<tr>
<td>13:00</td>
<td><strong>Report writing</strong></td>
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<tr>
<td>15:00</td>
<td><strong>Tea/coffee</strong></td>
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<tr>
<td>15:30</td>
<td><strong>Report writing</strong></td>
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### 8 November 2017

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<td></td>
<td><strong>Venue:</strong> Phillip Tobias</td>
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<tr>
<td>09h30</td>
<td><strong>Interview with the Department of Science and Technology</strong></td>
</tr>
<tr>
<td></td>
<td>- Dr Danny Adams, Chief Director: Emerging Research Areas and Infrastructure</td>
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<tr>
<td>10h30</td>
<td>Tea/coffee</td>
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<td>11h00</td>
<td>Report writing</td>
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<td>Lunch</td>
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<tr>
<td>14h00</td>
<td>Report writing</td>
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<tr>
<td>15h00</td>
<td><strong>Interview with the Deputy Chief Executive Officer Corporate: National Research Infrastructure Platforms (NRF)</strong></td>
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<td></td>
<td>- Dr Clifford Nxomani</td>
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<tr>
<td>15h30</td>
<td>Tea/coffee</td>
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<tr>
<td>16h00</td>
<td>Report writing</td>
</tr>
<tr>
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## 9 November 2017

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<td>09:00</td>
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<td>Tiyo Soga (formerly Albert Luthuli) Auditorium</td>
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<tr>
<td>09:30</td>
<td>Preparations for verbal feedback</td>
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<tr>
<td>10:00</td>
<td>Verbal feedback by the reviewers to NRF Staff, DST and interested parties</td>
<td></td>
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<tr>
<td>11:00</td>
<td>Debriefing session by panel members</td>
<td></td>
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<tr>
<td></td>
<td>• Assignment Principal</td>
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<tr>
<td></td>
<td>• Representatives of the NRF</td>
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<tr>
<td>12:00</td>
<td>Lunch</td>
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<tr>
<td>13:00</td>
<td>Reviewers return home [Shuttle service/ rental car]</td>
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</tbody>
</table>
Annexure 4

Analysis of South African researchers’ performance under the NRF-ESRF Arrangement during the reporting period 01 April 2013 to 30 September 2017

In order to ascertain whether there is a return on the investment made by the NRF in the NRF-ESRF Arrangement, an analysis of the performance of South African users of the ESRF is necessary.

With regard to success rate of applications for beam time, the E & R Panel found discrepancies in the data provided between i) the Sponsor Domain (NRF HICD Directorate) Self Evaluation Report for the reporting period and the individual annual reports of the NRF HICD Directorate, and ii) between the NRF HICD reports and the ESRF report. The ESRF numbers are higher because the ESRF reports on South African researchers who are main members (directly supported by the NRF-ESRF Arrangement), as well as South African researchers who are team members of collaborations led by main members from other countries (not supported by the NRF-ESRF Arrangement). For the purpose of this analysis, the data provided in Table 2 of the NRF Sponsor Domain Self Evaluation report is used, as shown below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of proposals submitted</th>
<th>Number of proposals awarded beam time</th>
<th>Success rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013/2014</td>
<td>12</td>
<td>7</td>
<td>58</td>
</tr>
<tr>
<td>2014/2015</td>
<td>13</td>
<td>7</td>
<td>54</td>
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<tr>
<td>2015/2016</td>
<td>11</td>
<td>7</td>
<td>64</td>
</tr>
<tr>
<td>2016/2017</td>
<td>11</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>24</td>
<td>51</td>
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</tbody>
</table>

The average success rate over the reporting period is 51%. This is in line with the global success rate and speaks to the ESRF’s desire to maintain a high quality of accepted proposals by only accepting the number of proposals at the peak of the Normal distribution over all submitted proposals.

Statistics acquired from the ESRF through its Director General indicate that close to 1% of all proposals submitted for beam time to the ESRF is awarded to South African researchers. This number is higher than the 0.33% that our membership allows as it includes South African researchers who are team members of collaborations in which the main members (the applicants for the beam time) are from other countries.

South Africans have been able to reach and maintain the NRF-ESRF Arrangement target of 0.33% beam time usage by using on average 0.33% of beam time consistently over the reporting period. Based on the data from the NRF Sponsor Domain Self Evaluation report, 24 main member South African user groups have been awarded beam time over the reporting period. It must be noted that of the 24 successful main member user groups, only 14 groups have managed to publish during the reporting period. Thus approximately 40% of the NRF-funded users are yet to publish their work.
An analysis of the demographics of the successful South African main member applicants in the NRF Sponsor Domain’s Self-Assessment report, indicates that although the success rate of the Black applicants is higher than that of their White colleagues, there is a significantly greater proportion of proposals from White researchers in general (both successful and unsuccessful) leading to White applicants (and particularly White males) dominating the allocated beam time for this country under the NRF-ESRF Arrangement.

Consequently, the R&E Panel proposes that the Arrangement with the ESRF be renegotiated in order to allow the NRF some intervention in the peer review process or at least some intervention in the decision on which of the proposals should be awarded beam time so that it is in line with our country’s transformation and redress agenda.

The number of South African publications since 2013 reported by the ESRF is 60, however a more accurate number is 46 as these 46 publications were produced solely during the reporting period of the NRF-ESRF Arrangement and publications during the first half of 2013 not included. Of these 46 publications, many have arisen through international collaborations which do not benefit from the NRF-ESRF Arrangement. The number of publications that resulted from South African main member applications that have directly benefitted from the NRF-ESRF Arrangement over the reporting period is 16. This translates to 3.6 papers per year on average.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of publications by a NRF-ESRF South African main member group</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>2</td>
</tr>
<tr>
<td>2015</td>
<td>1</td>
</tr>
<tr>
<td>2016</td>
<td>9</td>
</tr>
<tr>
<td>2017</td>
<td>4</td>
</tr>
</tbody>
</table>

It is encouraging to note from the above table that the number of publications increases by over 4-fold in 2016 and 2017 compared to the output in 2013-2015. This suggests that the partnership, which is still in its infancy, has strengthened over the 5 years. Furthermore, the extensive lag time (at least a year) between the award of beam time and physical access to the beamline at the ESRF, together with the time taken to analyse the data and complete an article can result in a turnaround time of the order of 2 years before publication. We can therefore expect to see an increase in output in the years subsequent to the reporting period.

The ESRF has reported statistics (see figure below) which show that over the reporting period, South Africa has maintained 0.33% beam time usage over all the years of the reporting period.
The disciplines of the earth sciences (which includes palaeontology), materials sciences, structural biology and chemistry have been instrumental in maintaining this target. The target was even exceeded by earth scientists. However, it is interesting to compare beam time usage with the research publications actually produced by the South African main members in each of the disciplines. This is shown in the figure below (imported from the ESRF report):

Here we see that the only discipline that consistently converts its beam time into publications is the earth sciences. The three other major users of the facility have not produced consistently over the reporting period. The progress of the users should be monitored more closely upon renewal of the Arrangement and can be facilitated by requesting formal regular reports to the NRF from the users upon completion of their work at the synchrotron. It is acknowledged that the difference in publication rates between the disciplines maybe due to discipline-specific challenges regarding time interval between obtaining and analysing data and producing a publication. Furthermore, it must be noted, as pointed out earlier, the lag time between the notification of allocation of beam time for a successful proposal and the actual time when the beamline is used by the researcher has been a minimum of 1 year for the South African main users that have been funded by the NRF. This lag time will also delay publication.
As regards the quality of the publications arising from the NRF-ESRF Arrangement, of the 16 publications 2 have been published in journals with impact factor greater than 7 (a metric used by the ESRF as an indicator of high impact work). The plot of journal impact factor for each of the publications of each of the disciplines, provided by the ESRF, is shown below and highlights that not only are the earth scientists publishing the most articles, their articles have been accepted in the leading journals in the field. The average impact factor for all 16 publications is 3.5 indicating that the work produced by South African researchers through the NRF-ESRF Arrangement is having a global impact.

Impact factor of the journals in which the South African main users published arranged by discipline

When analysing the outputs emanating from the NRF-ESRF Arrangement, another important aspect to consider is the participation of emerging researchers, postdoctoral fellows and postgraduate students. These outputs will assist in assessing the contribution to capacity development and transformation in South Africa. Unfortunately, the relevant information was not available as neither the NRF nor the ESRF have access to this information.

The E & R Panel proposes that in future a formal process be established by the NRF in which this information will be readily available by name, race, gender, nationality and qualification of the relevant participants. Mr Tshepo Ntsoane reported that SRRIC has, independently and informally collated its own list of synchrotron usage which was made available to the Panel by him. It must be noted that he admitted that the list may be incomplete due to the difficulty in obtaining the data directly from the users. Again this highlights the necessity for the NRF to function as the single point of communication with the ESRF and for related information gathering.

The E & R Panel proposes that the NRF explore with the ESRF a mechanism for such information to be captured by the ESRF at the point of beam line access and made available immediately to the NRF.

Dr. S Fanucchi Prof. R. Bharuthram 17 November 2017